



PATENT COOPERATION TREATY

PCT

REC'D 12 JAN 2005

INTERNATIONAL PRELIMINARY EXAMINATION REPORT PCT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference TS7608 PCT		FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)
International application No. PCT/EP 03/50674	International filing date (day/month/year) 01.10.2003	Priority date (day/month/year) 01.10.2002	
International Patent Classification (IPC) or both national classification and IPC G01N33/28			
Applicant SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ B.V.			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 8 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 1 sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the opinion</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>			
Date of submission of the demand 27.04.2004		Date of completion of this report 11.01.2005	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer Hanisch, C Telephone No. +49 89 2399-7156 	

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/EP 03/50674**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-21 as originally filed

Claims, Numbers

8-12 as originally filed

1-7 received on 07.12.2004 with letter of 02.12.2004

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b));
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/EP 03/50674**

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	3, 4, 6, 8 - 11
	No: Claims	1, 2, 5, 7, 12
Inventive step (IS)	Yes: Claims	
	No: Claims	1 - 12
Industrial applicability (IA)	Yes: Claims	1 - 12
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

Reference is made to the following documents:

D1: US-A-5 928 954

D2: WO-A-99/52708

D3: US-A-6 422 061

D4: WO-A-01/90539

1. Independent claims 1 and 5

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of independent **claim 1** is not new in the sense of Article 33(2) PCT for the following reasons:

Document **D1** discloses (the references in parentheses applying to this document) a lubricating oil composition ("*Method for tagging hydrocarbons ... can be utilized to tag ... lubricating oil...*", abstract) comprising passive markers ("*The hydrocarbon to be tagged is blended with a relatively small amount of a fluorescent dye*", abstract); which passive markers are capable of detection [...capable of being detected...] *in situ* by a detector present in a machine which is on or running. For assessing novelty, a claim has to be interpreted in its broadest possible way. Therefore, the nature of the passive markers is qualified by the above passage in that it must *in principle be possible* to detect them *in situ* by a detector present in a machine which is on or running (this part could possibly exclude extremely large detectors e.g. for neutrinos); the question of whether the markers are *in fact* being detected *in situ* depends on the type of the detector used - which is, however, not part of the lubricating oil composition. Therefore, this part of the claim is unclear and does not properly limit the scope of the claim - the skilled person is unable to judge if a certain lubricating oil composition (containing one or more certain passive markers) falls within the scope of the claim or not. Nevertheless, it is to be mentioned that document **D1** also discloses a detector for detecting

the passive markers in the liquid hydrocarbons: "...*the invention is an apparatus 110 depicted in FIG. 2 for detecting the presence of a tagged gasoline dispersed in a liquid located, for example, in a storage tank or a transfer pipe.*", col. 14, l. 60 - 63). It is thus possible to add the detector of **D1** to a machine which is on or running for the *in situ* detection of the passive markers described above. **D1** does not explicitly state the use of the detector in a running machine, nevertheless, if necessary, the detector could be adapted to such conditions (small path length, oil filters etc.).

Although one could argue that the skilled person would expect the marker dyes described in **D1** to degrade quickly in a running machine, the claim itself is silent on the question of degradation, e.g. how long and vigorous the machine was already running before a possible marker detection takes place. Moreover, this problem would affect every marker compound dissolved in the oil, the dyes of **D1** as well as for example the odourant molecules of the examples of the present application. In addition, it is stressed that the claim is directed to a lubricating oil composition *per se*. Thus, a prior art search e.g. by the skilled person is not limited to a certain intended use of the composition.

Therefore, **claim 1** is not new in the light of document **D1**.

In view of the argumentation above, it should be noted that document **D1** is only one example of many similar documents that could be cited anticipating claim 1, see e.g. the International Search Report.

The subject-matter of independent claim 5 corresponds in terms of method features to that of claim 1. The objections raised in respect of this latter claim, therefore, also apply, *mutatis mutandis*, to **claim 5** which is thus also not new.

2. Dependent claims 2 - 4

Dependent **claims 2 - 4** do not appear to contain additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step:

- since they are already disclosed in document **D1** (claim 2; dye = molecular species; see also document **D2** for microparticles) or document **D2** (claim 4; magnetic tags) which states on the first page of the description (l. 24 - 28): "*Fluids required by automobiles ... provide additional examples of the need for correct identification of liquids... Such color coding clearly is designed to prevent ... damage or even total destruction of the mechanical device...*". Therefore, the skilled person would just contemplate combining the teaching of this document (tagging of e.g. automobile fluids) with that of **D1** (tagging a lubricating oil composition) and would thus arrive at the subject-matter of claim 4 (which gives three marker options to choose from). It is again mentioned that the question of whether the markers are *in fact* being detected *in situ* depends on the type of the detector used which is not part of the lubricating oil composition (in example 2 of the present application, as in **D2**, the markers are not detected *in situ*). Regarding claim 4 it should also be noted that the use of RFID chips as passive markers in lubricating oil compositions is not known or obvious from the cited prior art (the nature of the *biomagnetic* tags also mentioned in claim 4 is not disclosed in the description of the present application);
- or since they are merely a selection of several possibilities known in the art (claim 3) from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill, in order to solve the problem posed, see e.g. document **D3**: "*The e-nose device can be used in a wide variety of commercial applications including ... detection and identification of ... diesel/gasoline/aviation fuel...*", col. 26, l. 62 - col. 27, l.14. Therefore, since lubricating oil composition usually contain volatile, odourant 'marker compounds' which could be detected by an e-nose device integrated into a machine, those passive markers are indeed capable of being detected *in situ* by an e-nose detector present in a machine which is on or running. This example also demonstrates that the scope of claim 1 is virtually not limited by the above passage (*...which passive markers are capable of...*).

3. Independent claims 6, 7 and 12

As can be seen from the fact that the aforementioned common technical features, linking together all claims of the application, are known in combination, *unity of invention does not*

exist between all different independent claims 1/5, 6, 7 and 12, and those depending on them, disclosing e.g. different types of markers. In addition, as the other three independent claims 6, 7 and 12 contain a reference to claim 1 (claim 12 refers back to claim 7 which itself refers back to claim 1), the lack of clarity of claim 1 is passed down to these claims. Nevertheless, the following remarks on the compliance of these claims with the core requirements of the PCT are made, in addition to the clarity problems mentioned above:

- i) **Use claim 6:** The comments (negative and positive) made under point 2 regarding the markers disclosed in claims 3 and 4 also apply, *mutatis mutandis*, to this independent claim.
- ii) **Apparatus claim 7:** A machine using lubricating oil and comprising, for example in the oil storage tank or an oil transfer pipe, the detector of document **D1** takes away the novelty of the machine disclosed in this claim - such a detector is indeed *suitable for detecting in situ* a passive marker in a lubricating oil composition according to claim 1, i.e. comprising passive markers which are *in principle* capable of being detected *in situ* by a detector present in a machine which is on or running (see the argumentation on claim 1, above). It is to be noted that in addition to the lack of clarity introduced by this desideratum feature and the reference to claim 1, the statement "*...when the lubricating oil composition is in the machine*" appears to limit the scope of the claim on machines containing the specified lubricating oils, although the oil does not form part of the machine itself (and is also not claimed as being part of it).
- iii) **Method claim 12:** The assessment of novelty and inventive step of this claim is hindered by the lack of clarity introduced by the reference back to claim 7 which is unclear and which itself refers back to claim 1 which is also unclear (see point 1 above). Nevertheless, it appears that the argumentation concerning claim 7 also applies, *mutatis mutandis*, to this method claim (see the title of document **D1**: "*...for subsequent identification*"), as methods of identifying lubricants whilst in the engine (see p. 5, l. 3 of the present application) and method of using oil detector data to determine when an oil change is required (see e.g. **D4**) are known *per se*.

It should be noted that a claim directed to the core idea of the application, i.e. a *method of determining when an oil change of a machine containing a lubricating system is required* using a non-obvious marker, added to the oil, to identify it *in situ*, appears to

fulfill the requirements of the PCT with respect to novelty and inventive step.

4. Dependent claims 8 - 11

Dependent **claims 8 - 11** do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step,

- since they are already disclosed in document **D1** (claim 8; see figs. 1 or 2 of **D1**) or **D4** (claim 11, see the abstract),
- since they relate to minor implementation details (claims 9 and 10) that do not add anything of inventive significance to the subject-matter of claims 7 or 8, see e.g. the abstract of document **D4**.

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C L A I M SREPLACED BY
ART 34 AMDT

1. A lubricating oil composition comprising one or more passive markers which passive markers are capable of detection in situ by a detector present in a machine.

2. A lubricating oil composition according to claim 1,
5 wherein the passive markers are selected from microparticles and molecular species.

3. A lubricating oil composition according to claim 1 or 2, wherein the passive markers are odourant molecules.

4. A lubricating oil composition according to claim 1
10 or 2, wherein the passive markers are chosen from Radio Frequency Identification (RFID) chips, biomagnetic tags and magnetic tags.

5. A method of providing a lubricating oil composition according to any one of claims 1 to 4 comprising
15 providing a lubricating oil and incorporating one or more passive markers into said lubricating oil which passive markers are suitable for detection in situ by a detector present in a machine.

6. Use of one or more of a Radio Frequency
20 Identification (RFID) chip, a magnetic tag, a biomagnetic tag and an odourant molecule as a passive marker for a lubricating oil composition according to any one of claims 1 to 4.

7. A machine comprising a detector for detecting in
25 situ a passive marker in the lubricating oil composition according to any one of claims 1 to 4 when the lubricating oil composition is in the machine.

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8. A machine according to claim 7, which comprises an electronic control unit and means to transmit a signal from the detector to the electronic control unit.

9. A machine according to claim 7 or claim 8, which

5 further comprises at least one sensor which indicates the state of the oil in the machine.

10. A machine according to claim 9, which comprises an electronic control unit and means to transmit a signal from the at least one sensor to the electronic control

10 unit.

11. A machine according to any one of claims 7 to 10, wherein the machine is an engine.

12. A method of operating a machine according to any one of claims 7 to 11, which method comprises:

15 (i) using the detector to provide data about the identity of the lubricating oil in the machine;

(ii) optionally, using the at least one sensor to provide data indicating the state of the oil; and

(iii) utilizing the data obtained in (i) and,

20 optionally, (ii) to determine when an oil change is required or to set values which can be used to determine when an oil change is required.